

# Cross-Cultural Perception & Structure of Music

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In the Western world, research is beginning to yield some promising connections between learning, development, and the use of music. Frances Rauscher (et al., 1994) investigated a link between spacial ability and listening to complex, non-repetitive music—the kind of music found in classical and some forms of jazz. Observations using positron emission tomography (Zatorre, 1984) revealed that casual listening to music caused an increase of activity in the right temporal lobe of the brain. But when subjects attended to specific aspects of music, areas of left hemisphere were also active (Frackowiak, 1994). This implies that listening to (and performing) music could have a role in developing learning potential.

As intriguing as these studies and findings might be, little has been said about how music might enhance or mediate the learning experience across cultures. To this end, it is possible that cross-cultural investigations into the structure and perception of music around the world might reveal some clues. By investigating questions such as; “Do people of different cultures hear and construct music similarly or differently?”, “Are there any universal properties associated with music?”, and “Does music affect people around the world in similar ways?”, perhaps we can learn better how music affects changes on us mentally and emotionally. And that could allow us more precise control over the use of music in instruction as well as provide a broader awareness of how people of different cultures might respond to music instruction in the traditional Western classroom.

## Ways of Hearing and Organizing Music

“Conceptions of music as “entertainment” or “diversion” grossly underestimates the seriousness and diversity of people’s engagement with music” (Sloboda, 1996). By comparing Western ideas to those around the world, we might gain a broader perspective of the possibilities within music.

## Music as an Expression of Philosophy

The way people in different cultures hear and organize music tends to conform with their philosophical beliefs and perceptions of cosmology. In the Western world, the organization of music is a complex interplay of basic musical elements. Melody, harmony, rhythm, tone-color, and form are seen as building blocks that combine to form musical richness. This method of organization reflects the Western philosophical paradigms that view nature as a composite of elemental parts. The people of Indonesia have a paradigm of nature that includes mandalic principles of repetition. This epicyle within cycle paradigm is reflected in the music and is exhibited by intricate and subtle rhythms expressing a “spiritual richness” (Kessler, Hansen & Shepard, 1984).

## Defining Rhythm

Western rhythm is known for its precision of timing and equal spacing of sub-beats within bars and measures. Half notes, quarter notes and quavers are mathematical fractions of the precisely defined measure. Indian rhythm is built on the concept of cycles and epicyle. Major cycles can extend as long as 512 beats. Intricate epicyles create complex interactions that weave their way through the major cycle to subtly refine and enrich the music (Jairazbhoy, 1997). Native American rhythm is controlled by the large drum that represents the beating of the heart (A. Mitchell, personal communication, March 4, 1998). And in Japan, music assumes the unpredictable rhythmic quality of nature. “Water dripping from a roof” is used to describe proper rhythm and the Japanese characters used for rhythmic timing literally translate to “the sound of a child clapping” (Lowry, 1995).

## Defining Melody and Harmony

In an extreme oversimplification of the process, the Western scale is constructed on the harmonic series described by Pythagoras. For example, where C is the fundamental tone, the harmonic sequence starting with the fourth harmonic through the sixth harmonic is C, E, and G which describes the tonic chord for the key of C. Higher harmonics produce most of the other notes needed for a complete scale and outlines the naturally tempered scale for the key of C (Pierce, 1983). Bach later adjusted the frequencies so that music could be played in other keys, on the same instrument, with each scale sounding equally in-tune (or equally out of tune, depending on your perspective). This is called Well tempering, or Equal tempering, and is the system now in predominate use.

Indian and Arabic music use scales similar to the Western scales but where Western music uses twelve equally spaced half steps in an octave, these music systems also include quarter steps giving the music a mode like quality to western ears (Danielson, 1997).

Indonesian music uses two scales that are completely unrelated to the Western scales, or to each other for that matter. The Pelog scale consists of seven unequally spaced notes of which five are used depending on the mode of the song. The Slendro scale has five equally spaced notes and uses all notes in the songs (Kessler, Hansen & Shepard, 1984). The primary instruments of this area are the gong, drum, and a marimba-like device with bamboo resonators and brass bars that are struck with mallets. Because of the physical properties of vibrating metals, the harmonic overtone series is stretched and does not conform to the Pythagorean integer ratios found in Western music (Pierce, 1983). This, combined with the non-diatonic structure of the scales, gives the music a jangly sound that is particularly dissonant, and perhaps for this reason, chords and harmonies play little or no role in Gamelan (gong and drum ensembles) music of Java and Bali (Kessler, Hansen & Shepard, 1984).

## Music as an expression of Emotion

Music is commonly held to be ‘the language of emotion,’ and our popular culture is full of phrases espousing the power of music to ‘sooth the savage beast’, ‘fuel the fires of passion’ and ‘express more than mere words could ever hope to express.’

It should be mentioned, however, that though it may be common, this belief does have notable critics and the debate is still far from settled. The composer, Igor Stravinski, stated that music does not have any special power or influence over our emotion when he said, “Music is, by its very nature, essentially powerless to express anything at all, whether a feeling, an attitude of mind, a psychological mood, a phenomenon of nature. . . .” Championing the other side of the debate, Felix Mendelssohn’s belief concerning the influential power of music was equally strong when he said, “The thoughts which are expressed to me, through a piece of music which I love, are not too indefinite to put into words, but on the contrary too definite” (McClellan, 1966).

In part, the problem of describing how music affects emotions depends on just how emotions themselves are described and organized. Robert Solomon identified forty-two emotions. They include: Anger, Anxiety, Anguish, Jealousy, Pity, Pride, Regret, Remorse, Sadness, Shame, Spite, Dread, Duty, Embarrassment, Envy, Fear, Grief, Vanity, Self-Contempt, Self-Hatred, Self-Pity, Self-Love, Joy, Self-Respect, Worship, Frustration, Guilt, Hate, Indifference, Indignation, Terror, Faith, Friendship, Hope, Innocence, Love, Respect, Contentment, and Rage. In contrast to that level of detail, Gerald Jompaulski identified only two primary emotions, love and fear, from which all other emotions are derived (McClellan, 1966). And similarly, Schlacter’s Labeling Theory asserts that emotions are merely labels which are used to interpret an elevated level of awareness. By assigning or generating a context, these labels serve to explain and justify a particular physiological state of arousal (Mook, 1987).

Approaching the problem from a different direction, John Sloboda (1991) defined musical affects in more behavioral terms. He surveyed a self selected group of 34 professional musicians, 33 amateur musicians, and 16 non-performing music listeners to learn the frequency that respondents experienced sensations from a list of physical responses. That list, in order of most reported frequency of occurrence, included; Shivers down the spine, Laughter, Lumps in the throat, Tears, Goose pimples, Racing heart, Yawing, and Pit of stomach sensation. Four other responses (Flushing, Sweating, Trembling, and Sexual arousal) were included in the questionnaire but

the survey indicated that music never evoked those physical responses.

In India, moods are arranged into nine sentiments, called *nava rasa*, which included; *Shangara*-erotic, *Hasya*-humorous, *Karuna*-sad, *Raudra*-furious, *Veera*-majestic, *Bhayanaka*-fearful, *Vibhatsa*-disgusting, *Adbhuta*-exhilarating, and *Shanta*-tranquil. These sentiments apply to artistic expression in the visual and literary arts as well as music, and it was believed that each and every artistic creation expressed one of these sentiments (McClellan, 1966).

### Natural and Cultural Aspects of Music

An important key to understanding music across the cultures is the establishment of how much of music's meaning is learned and how much is natural. If there is any common agreement regarding the natural "goodness" of music that is not culturally biased, the answers should be found in the culturally undifferentiated response of infants (Lynch & Eilers, 1991; Trehub, 1991; Unyk, Trehub, Trainor & Schellenberg, 1992). When presented consonant and dissonant tone intervals, infants responded more positively to the consonant melodies and harmonies. "These studies imply that some aspects inherent in the major triad are naturally 'good,' originating in universal constraints on auditory pattern processing" (Trehub, 1991). Individuals trained in Western music were better able to identify "out of tune target notes" in Western melodic and harmonic intervals and were significantly poorer in identifying "out of tune notes" in the Pelog scale than musically naive individuals who scored at the chance level (Lynch & Eilers, 1991). This seems to imply that the subtler aspects of melody, harmony and the associated overtone sequences are quite malleable, and even though some fundamental or biological music principles exist, much more is subject to association and cultural training.

### Summary and Discussion

Certain aspects of goodness in melody and harmony (particularly involving consonance of intervals) seem to be established at or near the time of birth when infants are culturally undifferentiated. Other aspects including tuning and tempering require training in order to sound "right" (Lynch, Eilers, 1991) and may induce culturally divergent perceptions of mood state. Surprising variations exist in scales, tuning, tempering and rhythm around the world and aspects we take for granted in Western music should not be assumed as universal when dealing with other forms of music or the people who know them. Music does seem to universally affect us in that it acts on mood and emotion, but established terms involving this area of study are still far from explicit or even well defined, and the results appear to be varied and unpredictable. This may be a result of the way we define mood (Mook, 1987) or it may be that music acts as an aural Rorschach, where we use gestalt principals to impose form and meaning when one is not provided in context.

Whether studying the science of musicology to better understand how music affects the human psyche or whether providing music instruction to a multi-cultural group of students, care must always be taken. Assumptions that might be valid for our own culture's music may not translate to another culture's music and by ignoring or dismissing alternative ways of expressing ourselves musically, we risk missing the true nature of music and possibilities that music may have to offer.

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### Glossary

- Epicycle - a circle that has a center which is itself carried along on the circumference of a larger circle. The celestial motions of the moons, planets and sun are epicyclic.
- Form - the structure in which the other elements (melody, harmony, tone-color, and rhythm) are combined.
- Gamelan - an ensemble of up to 40 Indonesian instruments consisting of gongs, brass marimbas, and drums. The instruments are permanently tuned to either the Pelog or Slendro scales and play only music written for their respective tuning.
- Harmonic - one of a series of overtones, or partials, that are produced from integer multiples of the vibration rate of a fundamental tone.
- Harmony - the combination of simultaneous notes as in a chord.
- Melody - a succession of single musical notes that describe a definite relation to an aesthetic whole.
- Mode - any one of the seven possible arrangements of the diatonic tones in an octave. Currently, the two in common usage are major and minor.
- Octave - two notes that sound the "same" but one sounds higher than the other, or more precisely, where the frequency of the second note is exactly twice that of the first.
- Pelog - the musical scale used in Indonesian Gamelan music that consists of 7 unequally spaced pitches within an octave. A subset of five notes is used in the various modes of the Pelog scale.
- Quaver - an eighth note, derived from "to shake or quiver"
- Rhythm - the temporal pattern produced by grouping, stressing and balancing various tone lengths within an underlying steady and persisting succession of beats as defined by accent, meter, time and tempo.
- Scale - the collection of all of the available pitches in a music system.
- Slendro - the musical scale used in Indonesian Gamelan music that consists of 5 somewhat equally spaced notes within an octave.
- Timbre - the harmonic overtone signature of a tone. For example, it is timbre that allows us to listen to notes played by two different instruments and identify one as being a "clarinet" and the other as a "trumpet."
- Tempering - adjustments made to a musical scale. Tempering is the attempt to compromise and reconcile conflicting demands of the harmonic characteristics of music.
- Tone-color - sometimes used interchangeably with timbre, the quality that shapes tones for use in music. It also includes characteristics that are described as warm, harsh, bright, mellow, etc. (See timbre).

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